FACE INVESTIGATION

SUBJECT: Coating machine operator electrocuted while assisting electrician with circuit breaker wiring

SUMMARY: A 44-year-old male coating machine operator (the victim) was electrocuted while assisting a company electrician who was re-routing wires from one circuit breaker to another. The electrician discovered that a circuit breaker that served the coating machine was malfunctioning, and was in the process of moving the wires from the malfunctioning circuit breaker to an unused breaker located inside a panelboard. The victim had removed the front panel from the adjacent panelboard where the unused circuit breaker was located. Lockout/tagout procedures were not being used during this process because de-energization of the coating machine would have caused the coating solutions to cool and clog the machine parts. The electrician had run the wires from the malfunctioning circuit breaker up and over the top inside of the panelboard to the adjacent open panelboard. At that time, the victim asked if he should pull the wires through, and the electrician directed the victim to pull the wires. While reaching into the panelboard, the victim's left arm touched an energized busbar carrying 2000 amperes, and he was electrocuted. The electrician noticed the victim lying on the floor, with his hand still in the panelboard. The electrician kicked the victim's hand loose from the busbar, and called for help. Two workers in the area responded and began CPR procedures, until EMT's took over. The victim was transported to the local hospital, where he was pronounced dead. The Wisconsin FACE investigator concluded that, in order to prevent similar circumstances, employers should:

! **Ensure that only fully trained and qualified personnel are permitted to work with energized electrical sources, in accordance with OSHA requirements.**

! **Develop, implement and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards, especially electrical hazards.**

INTRODUCTION: On September 12, 1993, a 44-year-old coating machine operator (the victim) was electrocuted while assisting a company electrician in relocating wires from a malfunctioning circuit breaker. The Wisconsin FACE investigator was notified by the Wisconsin Department of Industry, Labor, and Human Relations, Workers Compensation Division, on September 16, 1993. On September 24, 1993, the WI FACE field investigator conducted an investigation of the incident. A visit was made to the site of the incident, and a company representative was interviewed. Photographs were taken of the site of the incident. The investigator obtained copies of the death certificate, coroner's report, police report and

photographs, worker's compensation claim, and OSHA report.

The company specializes in producing coated, flexible packaging materials. It has been in business for twenty-seven years, and has 104 employees. Ten workers were classified as coating machine operators. Operators are at work on weekday and evening shifts, and portions of the machines are left on around the clock to prevent coating materials from clogging machine parts, or becoming overheated.

The company relies on all workers to identify safety hazards, and asks the workers involved in the operations to recommend changes to any level of management to eliminate the hazards. There was no designated safety director at the time of the incident. There were no written work procedures to describe the duties of a coating machine operator. The company had lockout/tagout policies that identified employees who were authorized to work with power-on operations. This was the first fatality the employer had experienced.

New employees are given on-the-job training to learn their duties. The operation of the coating machines has become more complex over the years, and operators are involved in selecting and maintaining the equipment that they use each workday. Operator assistants work side-by-side with operators, and learn the process through observation and task assignment from the operator.

The victim had worked for this company for nine years. Training records indicated he received six OSHA Hazard Communications contacts since he was hired, but the records do not indicate whether he received information about electrical hazards.

INVESTIGATION: The victim and the electrician were at the worksite on the Sunday afternoon of September 12, 1993, to locate and repair malfunctioning electrical equipment on the coating machine. In order to identify possible malfunctions the electrician required the assistance of the victim to describe the normal operations of the machine. They had concluded that one of the circuit breakers that served the machine was not working properly. The electrician determined that rerouting the wires from the malfunctioning circuit breaker to another circuit breaker would correct the problem. The panelboard had an electrical service of 480 volts, three phase, ungrounded and the busbars in the panelboard were energized at 2,000 amperes. The panelboard contained a warning sign for electrical hazards and contained directions to turn off the power supplying the equipment before working on or inside the unit. Energized devices within the panelboards were not de-energized, locked and tagged. The electrician had removed front panels from the panelboard, and located the faulty circuit breaker on the bottom area. He had removed three wires from this circuit breaker and had re-routed them up the inside of the panelboard to the top of the left side panel. The victim had removed the front panel from another panelboard that contained the unused circuit breaker, and was standing nearby. When the electrician put the wires over the left side panel, the victim asked if he should pull the wires, and the electrician agreed that the victim could pull them through. While reaching into the panel box to pull the wires, the victim touched a live busbar carrying 2000 amperes with his left arm, and he was electrocuted (Figure). The electrician noticed the victim lying on the floor, with his hand still in the panelboard. The electrician kicked the victim's hand

loose from the busbar, and called for help. Two workers in the area responded immediately and began CPR procedures, until EMT's took over. The victim was transported to the local hospital, where he was pronounced dead.

CAUSE OF DEATH: The death certificate lists the cause of death as electrocution.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: Employers should ensure that only fully trained and qualified personnel are permitted to work with energized electrical sources, in accordance with OSHA requirements.

Discussion: In this incident, the victim offered to assist the electrician by pulling wires through the panelboard. The victim was not trained to work with panelboards that contained energized electrical sources, and should not have become involved in a procedure that exposed him to this hazard. Employers should identify those situations that require workers to work with energized electrical sources, and ensure that only qualified persons are permitted to work on those sources as required by OSHA standards 1910.333 (a) and (c).

Recommendation #2: Employers should develop, implement and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards, especially electrical hazards.

Discussion: At the time of the incident, the company did not have a formal safety program. A safety program that described a safe procedure for working with or near energized equipment should prevent unintentional contact with energized busbars.